

IN THE CLAIMS

Please amend the claims as follows:

1. (Original) A network system for supporting mobile Internet communication comprising:

a plurality of Routers each having unique communication address;

a plurality of Mobile Nodes (MNs) being movable to various locations to communicate with the Internet via different Routers at different locations;

each MN associated with a home Router;

each Router having an associated Mobile Node Location List identifying each MN for which the Router is the home Router and the communication address of a Router corresponding to a current location of each such MN; and

each MN movable from an old location where the MN communicates with the Internet via one Router to a current location where the MN communicates with the Internet via a different Router by communicating to the MN's home Router the communication address of the different Router as the communication address corresponding to the MN's current location whereby a data communication from a corresponding node (CN) to a selected MN is communicated to the selected MN by accessing the Mobile Node Location List of the selected MN's home Router to determine the communication address corresponding to the selected MN's current

location and directing the data communication to that determined communication address.

2. (Original) A method of mobile Internet communication comprising:

providing a plurality of Routers each having unique communication address;
providing a plurality of Mobile Nodes (MNs) being movable to various locations to communicate with the Internet via different Routers at different locations where each MN associated with a home Router;

providing each Router with an associated Mobile Node Location List identifying each MN for which the Router is the home Router and the communication address of a Router corresponding to a current location of each such MN; and

when each MN moves from an old location where the MN communicates with the Internet via one Router to a current location where the MN communicates with the Internet via a different Router, establishing communication ability via said different Router by communicating to the MN's home Router the communication address of the different Router as the communication address corresponding to the MN's current location whereby a data communication from a corresponding node (CN) to a selected MN is communicated to the selected MN by accessing the Mobile Node Location List of the selected MN's home Router to determine the

communication address corresponding to the selected MN's current location and directing the data communication to that determined communication address.

3. (New) A network system according to claim 1 wherein:

each Router is an Access Router (AR) having a unique Internet Protocol (IP) address and a geographic access range in which the ARs communicates data to the MNs;

each MN is associated with a home AR;

each AR has as its Mobile Node Location List an associated Node Location Table (NLT) identifying each MN for which the AR is the home AR and the IP address of a current location of each such MN; and

each MN is movable outside the access range of its home AR to a location within the access range of a selected one of any of the other ARs to receive data via the selected AR by communicating to its home AR the IP address of the selected AR as its current location whereby a data communication from a corresponding node (CN) to a selected MN is communicated to the selected MN by directing a query to the IP address of the selected MN's home AR, receiving the IP address of the current location of the selected MN from the NLT of the selected MN's home AR and directing the data communication to the received IP address.

4. (New) A network system according to claim 3 further comprising:

a plurality of Access Points (APs), at least one AP associated with each AR such that said MNs communication with said ARs via said APs; and

each AP having an access range in which the AP communicates data to MNs whereby the access ranges of the APs associated with a given AR collectively define the access range of that AR.

5. (New) A network system according to claim 4 further comprising a plurality of Access Network Gateways (ANGs), at least one AR associated with each ANG and each ANG being coupled with the Internet.

6. (New) A network system according to claim 1 wherein each Router is a Network Address Translation router (NAT) further comprising:

a plurality of networks, each having:

a different one of said NATs with a unique global address;

at least one Host associated with the network's NAT; and

at least one Mobile Node (MN);

each Host having a service area in which it can communicate data to the MNs;

each MN having a home Host in a home network which defines a default local

address which is paired with the global address of the home network's NAT to define a default binding of the MN;

the NAT of each network having as its Mobile Node Location List an associated Mobile-Home Database (MHD) which identifies:

each MN, which has the network as its home network, with:

a local address of a current association of the MN with a Host in the network, or

a binding defined by a local address of an association of the MN with a Host in a different network and the global address of the different network's NAT; and

each visiting MN, which is a MN currently associated with a Host within the network, but has a different home network, with a local address of the current Host association of the MN;

each MN being movable from a location where the MN communicates data via a first associated Host in a first network having a first NAT to:

a location within the service area of a second Host within the first network to communicate data via the second Host by communicating to the MHB of the first NAT a local address reflecting the MN's association with the second Host; or

a location within the access range of a third Host within a different

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second network having a second NAT to communicate data via the third Host by communicating to the MHB of the second NAT a local address reflecting the MN's association with the third Host and, where the second network is not the MN's home network, by also communicating to the MHB of the MN's home network's NAT a binding including a new local address reflecting the MN's association with the third Host and the global address of the second NAT;

such that a data communication from a corresponding node (CN) to a selected MN is communicated to the selected MN by:

establishing a binding based on the MN's default binding or the binding reflected in the MHB of the MN's home network's NAT, and

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directing the communication to the local address identified for the MN in the MHB of the NAT with which the binding is established.

7. (New) A network system according to claim 6 wherein at least one network has a plurality of Hosts and at least one Host is the home Host for a plurality of MNs.

8. (New) A network system according to claim 6 wherein each network's NAT's MHD identifies local and global addresses and a location field such that:

each MN, which has the network as its home network, is identified with:

AI a local address of a current association of the MN with a Host in the network, a null global address, and a home flag in the location field, or

a binding defined by a local address of an association of the MN with a Host in a different network and a global address of the different network's NAT and an away flag in the location field; and

each visiting MN is identified with:

a local address of the current Host association of the MN, a null global address, and a home flag in the location field.

CONT 9. (New) A method of communication between a Corresponding Node (CN) and a Mobile Node (MN) over the Internet using datagrams having a header portion and a data portion where the header portion includes a source Internet Protocol (IP) address, a destination IP address and a protocol type wherein the CN communicates with the Internet via a router having a first IP address, the MN is associated with a home Access Router (AR) having a second IP address and the MN is in communication with the Internet via an AR having a third IP address, the method comprising:

A | the CN sending a first datagram identifying the first IP address as the header source IP address, the second IP address as the header destination address, an Internet Control Message Protocol (ICMP) as the header protocol type, and a query as to the location of the MN is included in the data portion of said first datagram;

the home AR receiving the first datagram from the CN and replying with a second datagram wherein the second IP address is the header source IP address, the first IP address is the header destination IP address, an ICMP is the header protocol type, and a query reply containing the third IP address is included in the data portion of the second datagram;

CONT the CN receiving the second datagram and sending at least a third datagram having the first IP address as the header source IP address, the third IP address as the header destination IP address, a data message protocol as the header protocol type and includes an identification of the MN and communication data for the MN in the data portion of said third datagram; and

the MN receiving the communication data contained in said third datagram via the AR with which the MN is in communication.

10. (New) A method according to claim 9 wherein

the home AR maintains a Node Location Table (NLT) identifying each MN

for which the AR is the home AR and the IP address of a current location of each such MN;

the current location IP address being the third IP address which is equal to the second IP address if the MN is in communication with the Internet via its home AR; and

the home AR creates the data portion of the second datagram by referencing the Node Location Table (NLT).

11. (New) The method according to claim 10, further comprising:

the MN sending a datagram when the MN communicates with the Internet via an AR which is not its home AR wherein the MN datagram includes the third IP address as the header source IP address, the second IP address as the header destination IP address, a User Data Protocol (UDP) as the header protocol and includes an identification of the home AR and the third IP address in the data portion of the MN datagram; and

the home AR receives the MN datagram and uses the data portion thereof to update the NLT associated with the home AR.

12. (New) A method for mobile Internet communication system which includes a plurality of networks each having a Network Address Translation router

AI (NAT) and a unique global address, at least one Host associated with the NAT, and at least one Mobile Node (MN), each Host having a service area in which it can communicate data to the MNs, each MN having a home Host and a home network which defines a default local address which is paired with the global address of the HN's NAT to define a default binding of the MN, the method comprising:

providing an associated Mobile-Home Database (MHD) for the NAT of each network which identifies:

each MN, which has the network as its home network, with:

a local address of a current association of the MN with a Host within the network, or

CONT a binding defined by a local address of an association of the MN with a Host within a different network and the global address of the different network's NAT; and

each visiting MN, which is a MN currently associated with a Host within the network, but has a different home network, with a local address of the current Host association of the MN;

when a MN moves from a location where the MN communicates data via a first associated Host within a first network having a first NAT to a location within the service area of a second Host within the first network to communicate data via the second Host, communicating to the MHB of the first NAT a local address

reflecting the MN's association with the second Host;

AI when a MN moves from a location where the MN communicates data via the first associated Host within the first network to a location within the access range of a third Host within a different second network having a second NAT, to communicate data via the third Host, communicating to the MHB of the second NAT a local address reflecting the MN's association with the third Host and, where the second network is not the MN's home network, by also communicating to the MHB of the MN's home network's NAT a binding including a new local address reflecting the MN's association with the third Host and the global address of the second NAT; and

CONT communicating a data communication from a corresponding node (CN) to a selected MN by:

establishing a binding with a NAT based on the MN's default binding or the binding reflected in the MHB of the MN's home network's NAT, and

directing the communication to the local address identified in the MHB of the NAT with which the binding is established for the MN.

13. (New) A method according to claim 12 wherein:

each network's NAT's MHD identifies local and global addresses and a location field such that:

each MN, which has the network as its home network, is identified with:

AI a 24 bit local address of a current association of the MN with a Host in the network, a null global address, and a home flag in the location field, or

a binding defined by a local address of an association of the MN with a Host within a different network and a global address of the different network's NAT and an away flag in the location field; and each visiting MN is identified with:

a local address of the current Host association of the MN, a null global address, and a home flag in the location field; and

CONT a binding is established between the CN and an MN based on the binding reflected in the MHB of the MN's home network's NAT when the corresponding location field has an away flag.

14. (New) A Network Address Translation router (NAT) for a network system which includes a plurality of networks, each having a NAT with a unique global address, at least one Host associated with the NAT and at least one Mobile Node (MN), each Host having a service area in which it can communicate data to the MNs, each MN having a home Host and home network which defines a default local

address which is paired with the global address of the home network's NAT to define a default binding of the MN, the NAT comprising:

a Mobile-Home Database (MHD) which identifies:

each MN, which has as its home Host, a Host associated with the NAT,

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with:

a local address of a current association of the MN with a Host associated with the NAT, or

a binding defined by a local address of an association of the MN with a Host not associated with the NAT and the global address of the NAT associated with that Host; and

each MN, which is currently associated with a Host associated with the NAT, but has a home Host which is not associated with the NAT, with a local address of the current Host association;

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such that a data communication from a corresponding node (CN) to a selected MN which has as its home Host, a Host associated with the NAT, is communicated to the selected MN by:

establishing a binding based on the MN's default binding or the binding reflected in the MHB of the NAT, and

if the binding is established is established with the NAT, directing the communication to the local address identified in the MHB.

15. (New) A NAT according to claim 14 wherein the MHD identifies 24 bit local and global addresses and a location field such that:

each MN, which has as its home Host, a Host associated with the NAT, is identified with:

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a 24 bit local address of a current association of the MN with a Host associated with the NAT, a null global address, and a home flag in the location field, or

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a binding defined by a 24 bit local address of an association of the MN with a Host not associated with the NAT and a 24 bit global address of the NAT associated with that Host and an away flag in the location field; and

each MN, which is currently associated with a Host associated with the NAT, but has a home Host which is not associated with the NAT, is identified with:

a 24 bit local address of the current Host association of the MN,
a null global address, and a home flag in the location field.
